

Introduction to Solar Energy Systems

Outline of Instruction

Course Information

Organization	Monroe County Community College, Applied Science and Engineering Technology
Development Date	March 3, 2011
Course Number	ELEC 157
Potential Hours of Instruction	60
Total Credits	3

Description

This course introduces the basics of solar energy systems - collection, conversion, transmission, and storage for both thermal and photovoltaic systems. Topics include history, terminology, solar radiation, domestic hot water systems, passive solar house heating, and Photovoltaic power systems.

Major Units

- Introduction to solar energy systems
- Nature of solar radiation
- System components and configurations
- System demand and sizing
- Mechanical Integration
- Electrical Integration
- Economic, environmental, and political issues
- Site planning and surveys
- Commissioning, maintenance, and troubleshooting
- PV special considerations and equipment

Types of Instruction:

Instruction Type	Contact Hours
Classroom Presentation	30
On-Campus Laboratory	30

Co-requisites

ELEC 125 (Fundamentals),
ELEC 156 (Intro to Renewable Energy Systems)
MATH 119 (Elementary Tech Math) or qualifying COMPASS score

Exit Learning Outcomes

General Education Outcomes

- A. Communicate ideas in writing using the rules of standard English
- B. Communicate information in writing using the rules of standard English
- C. Apply mathematical approaches to the interpretation of numerical information
- D. Apply mathematical approaches to the analysis of numerical information
- E. Demonstrate an understanding of the process of scientific inquiry
- F. Use computer technology to retrieve information
- G. Use computer technology to communicate information

Course Outcomes

- 1. Define key aspects of the current solar energy industry, including different locations, markets, scale, technologies, and trends.
- 2. Identify and define solar energy fundamentals concepts
- 3. Identify and define safety aspects for solar energy systems
- 4. Accurately explain the benefits, limitations, and tradeoffs of solar energy systems
- 5. Identify the various types of solar energy systems, including components
- 6. Practice system sizing for both domestic hot water and simple PV systems
- 7. Practice electrical design of solar PV systems
- 8. Conduct a solar energy site assessment and quantify the amount of solar energy available at a particular site.
- 9. Design a simple residential scale photovoltaic system.
- 10. Conduct an economic and environmental assessment of proposed photovoltaic systems.
- 11. Conduct a basic home energy audit and make energy efficiency and conservation recommendations.
- 12. Obtain preparation for NABCEP PV Entry Level Test.